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EXAMINER	
GOLUB-MILLER, MARCIA A	

ART UNIT	PAPER NUMBER
2828	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/805,824	ZHENG, TIEYU	
	Examiner	Art Unit	
	MARCIA A. GOLUB-MILLER	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-29,31-34,36-40 and 42-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-29,31-34,36-40 and 42-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claim 25 filed on 11/08/10 have been considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007).

In this case, Yamauchi teaches an element (TEC) with a bottom portion made from a ceramic plate. TEC element is used for mounting a semiconductor laser and has to fit inside an optical module and therefore needs to be compact. Malone teaches a ceramic plate that is part of the ceramic carrier that is used for mounting a semiconductor laser, the ceramic carrier has to fit inside an optical module and is

therefore needs to be compact. Malone teaches making the ceramic plate T-shaped in order to better fit inside the optical module. Therefore it would have been obvious to use the teaching of Malone for making other ceramic plates/carriers that are used in optical modules to be T-shaped or any other shape that is appropriate for a given configuration.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim recites the limitation "laser light control device". There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by incorporating the following limitation in the beginning of the claim “further comprising a laser light control device”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 25, 26, 28, 29, 31, 33, 34, 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamauchi et al. (2001/0033592), hereinafter ‘592, and further in view of Malone et al. (6,888,169) hereinafter ‘169.

Figs 5a and 11b of ‘592 disclose an optoelectronic module comprising:

25. “a stepped substrate [2] having a lower portion and an upper portion;

a thermo-electric cooler [3a] disposed on the lower portion, wherein the thermoelectric cooler has a top portion [3, 4] and a bottom portion;

a laser light source [1] disposed on the top portion [3,4] of the thermo-electric

cooler [3a]."

'592 does not disclose:

"wherein the bottom portion of the thermo-electric cooler is T-shaped and wherein the T-shaped bottom portion allows a plurality of cavities to be defined, wherein the cavities configured to route electrical traces to the thermo-electric cooler contribute to compactness of a footprint of the module"

However, making ceramic plates of different shapes is well known in the art as evidenced by Fig 3 of '169, which discloses making two apertures in the ceramic plate in order to accommodate other objects and conductive traces. The top and bottom plates of the TEC device of '592 are formed of ceramic plates [paragraph 0050].

One of ordinary skill would have been motivated to incorporate the teaching of '169 into the device of '592 by making the bottom plate of the TEC T-shaped to accommodate the available space and the electrical connection in order to reduce the size of the laser module.

'592 and '169 disclose:

26. "further comprising an electrical connection [1c] to the laser light source, and a structure [cap] defining an enclosed environment and including the substrate, wherein:

the substrate [2] is at least partially disposed in the enclosed environment; and

the thermo electric cooler [3a], the laser light source [1] and the electrical connection [1c] are disposed in the enclosed environment." (paragraph 0065)

28. "further comprising a laser light control device [21] that includes at least one of a driver and an amplifier."

29. "wherein the thermo-electric cooler [3a] includes a plurality of elongated thermo-electric elements, the thermo-electric elements being disposed substantially in parallel between the top portion [3] and the T-shaped bottom portion of the thermo-electric cooler."

31. "wherein the laser light source [1] is disposed directly on the thermo-electric cooler [4]."

33. "wherein the thermo-electric cooler [3a, 4] has a height that is substantially the same as the upper portion of the substrate."

34. "wherein the substrate [2] includes a substrate body comprising a one-piece component."

42. "wherein the laser light source [1] comprises a laser diode device."

43. "further including a cap [cap] partially defining the enclosed environment, the cap being disposed on the substrate [2]. (paragraph 0065)

44. "further comprising an overhanged ring disposed on a perimeter of the substrate [2] and supporting the cap [cap] thereon."

45. "wherein the cap [cap] includes an optical window [2a] adapted to facilitate an exit of laser light bundles [1a] from the enclosed space."

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over '592 and '169 as applied to claim 25 above, and further in view of Watts et al. (6,729,143), hereinafter '143.

'868 discloses an optoelectronic module as described above, in addition '592 discloses using a submount between the laser and the TEC. However, Fig 3 of '143 discloses:

31. "wherein the laser light source [12] is disposed directly on the thermo-electric cooler [31]."

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '143 into the device of '592 by placing the laser directly on top of the TEC for at least the purpose of improving the heat dissipation from the laser.

Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over '592 and '169 as applied to claim 25 above, and further in view of Acklin et al. (6,778,576) hereinafter '576.

'592 discloses an optoelectronic module as described above:

"wherein the laser light source emits light bundles in a direction substantially parallel with a top surface of the thermo-electric cooler"

'592 does not disclose:

37. "the module further including an optical device disposed on the substrate and adapted to redirect the light bundles from the direction substantially parallel with the top surface of the thermo-electric cooler to a direction that is substantially orthogonal to the top surface of the thermo-electric cooler.

38. wherein the optical device includes at least one of a mirror assembly and prisms.

39. wherein the optical device is disposed on the thermo-electric cooler."

However, Fig 1 of '576 discloses using a mirror 17 and lens assembly 14 disposed on top of a TEC 25 to redirect the light emitted by the laser 5 in an orthogonal direction.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '576 into the device of '592 by adding a light steering device on the TEC for at least the purpose of redirecting the light in the orthogonal direction in order to make the assembly compatible with a CAN type package.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over '592 and '169 as applied to claim 25 above, and further in view of Rosenberg et al. (6,703,561) hereinafter '561.

'592 discloses an optoelectronic module as described above, but does not disclose:

40. "wherein the substrate includes a ceramic material."

However, '561 discloses making the substrate 70 out of a ceramic material. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '561 into the device of '868 by making a ceramic substrate for at least the purpose of improving the heat dissipation from the laser.

Claims 32, 36 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over '592 and '169 as applied to claims 25 and 28 above, and further in view of Stewart et al. (2003/0043868) hereinafter '868.

'592 discloses an optoelectronic module as described above, in addition he

discloses thermal connection 9 to the substrate to dissipate the heat from the laser, but does not disclose vias in the substrate, however, fig 1 of '868 discloses:

32. "wherein the substrate [102] includes a substrate body and a plurality of vias [holes for 104] extended through the substrate body, the vias being adapted to provide electrical connections [110] to the thermo-electric cooler [200] and to dissipate thermoelectricity from the thermo-electric cooler."

36. "wherein the substrate [102] includes a substrate body and a plurality of vias [holes for 104] extended through the substrate body, the vias being adapted to provide electrical connections [110] to the laser light control device [504]."

46. "wherein the optical window [304] includes a flat glass window."

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of '592 by making vias in the body of the substrate and making the output window out of flat glass, since such elements are well known in the art of semiconductor packaging.

Claims 25, 26 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oomori et al. (2003/0081289) hereinafter '289, and further in view of '169 as applied to claim 25 above.

Figs 1-3 of '286 disclose an optoelectronic module comprising:

25. "a stepped substrate having a lower portion [4a] and an upper portion [38];

a thermo-electric cooler [24] disposed on the lower portion [4a], wherein the thermo-electric cooler has a top portion and a bottom portion,

a laser light source [30] disposed on the top portion of the thermo-electric cooler [24];"

'289 does not disclose:

"wherein the bottom portion of the thermo-electric cooler is T-shaped, and wherein the T-shaped bottom portion allows a plurality of cavities to be defined, wherein the cavities configured to route electrical traces to the thermo-electric cooler contribute to compactness of a footprint of the module;"

However, making ceramic plates of different shapes is well known in the art as

evidenced by Fig 3 of ‘169, which discloses making two apertures in the ceramic plate in order to accommodate other objects and conductive traces. The top and bottom plates of the TEC device of '289 are formed of ceramic plates as is well known in the art.

One of ordinary skill would have been motivated to incorporate the teaching of ‘169 into the device of ‘289 by making the bottom plate of the TEC T-shaped to accommodate the available space and the electrical connection in order to reduce the size of the laser module.

'289 and ‘169 disclose:

26. “further comprising an electrical connection [46] to the laser light source [30], and

a structure [4] defining an enclosed environment and including the substrate, wherein:

the substrate [4a, 38] is at least partially disposed in the enclosed environment; and

the thermo electric cooler [24], the laser light source [30] and the electrical connection [46] are disposed in the enclosed environment.”

47. “further comprising a laser light control device [42] disposed on the upper portion [38] of the stepped the substrate and in the enclosed environment,

an electrical connection [46] electrically coupling the laser light control device [42] to the laser light source [30],

wherein the substrate includes a substrate body [4] and a plurality of first vias [holes for 4d] extending through the substrate body, the first vias being adapted to provide electrical connections [4d] to the thermo-electric cooler [24] and to dissipate thermoelectricity from the thermo- electric cooler; and

a plurality of second vias [holes for 4c] extending through the substrate body, the second vias being adapted to provide electrical connections [4c] to the laser light control device [30].”

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** Applicant is reminded

of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARCIA A. GOLUB-MILLER whose telephone number is (571)272-8602. The examiner can normally be reached on M-Th 9:30-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marcia A. Golub-Miller/

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